Possum Point Dewatering Discharge Evaluation

Collection and Analysis of Representative Samples

1. The project should establish and document the process for obtaining samples that are a considered representative of dewatering wastewater.
2. At least one representative sample should be collected and analyzed for all of the parameters in Tables 1 and 2 below (these two tables capture all needed parameters in Tables 3, 4, 5 and 6).
    a. NOTE: Samples should be collected and analyzed for dissolved and total recoverable metals.
3. The analyses must be performed by a laboratory that is certified to do work in Virginia.

Estimated Allowable Discharge Concentrations

Allowable dewatering concentrations have been estimated for all parameters with applicable water quality criteria. Three potential discharge locations were evaluated: Outfall 004 (low volume waste pond discharge), Outfall 005 (Ash Pond E discharge) and Outfall 001/002 (Unit 3 condenser cooling, Units 5 and 6 CT blowdown). Estimated allowable concentrations for Outfalls 004, 005 and 001/002 are presented in Tables 1, 3 and 5, respectively. These estimates were made using standard DEQ wasteload allocation procedures and are based on the following inputs:

1. Outfall 004: Water from dewatering is mixed with process wastewater in the low volume waste pond and the combined wastewater is discharged through Outfall 004. The following inputs were used:
    a. Hardness-based water quality criteria were determined using a flow-weighted hardness calculated with hardness values of 100 mg/L for the combined wastewater discharge from Outall 004 and 50 mg/L (default hardness used by DEQ for mixing with Quantico Creek from Fact Sheet).
    b. The pH and temperature values of 8.6 and 25°C for calculation of the ammonia criteria were taken from the permit Fact Sheet.
    c. Dilution assumptions of 1:1 and 50:1 were used for the acute and chronic criteria, respectively (default assumptions used by DEQ in VPDES permit Fact Sheet).
    d. Assumed zero (0) background concentrations of all parameters in Quantico Creek (this is consistent with DEQ assumptions used in development of permit).
2. Outfall 005: Water from dewatering is either discharged directly to Quantico Creek or is mixed with other process wastewaters prior to discharge through Outfall 005.
    a. All inputs used were the same as for Outfall 004 except for dilution assumptions. For Outfall 005 the DEQ assumes a 1:1 dilution for application of both the acute and chronic water quality criteria.
3. Outfall 001/002: Water from dewatering is mixed with the Unit 3 condenser cooling water and Units 5 and 6 CT blowdown and the combined wastewater is then discharged through Outfall 001/002. Allowable dewatering concentrations were estimated for all

parameters with applicable water quality criteria at dewatering discharge flows from 0.05 to 20 MGD. The following inputs were used:

a. Hardness-based water quality criteria were determined using a flow-weighted hardness calculated with hardness values of 100 mg/L for the dewatering discharge and a hardness of 170 mg/L for Outfall 001/002 (average hardness from toxicity test results for this discharge).
b. Temperature and pH values of 28°C and 8.4, respectively, were used for calculation of the ammonia criteria (values taken from application Form 2 C as presented in Fact Sheet).
c. A discharge flow of 86.38 MGD was used for Outfall 001/002 for mixing with the dewatering discharge (average flow for Outfall 001/002 from Form 2C of permit application). It was assumed that the water quality criteria would be met in the cooling water discharge (i.e., no additional dilution was applied following discharge to the stream).
d. Background concentrations for Outfall 001/002 were taken from discharge data presented in the permit Fact Sheet.

Relevant portions of the draft VPDES permit Fact Sheet are attached.

Table 1. Possum Point Dewatering Discharge Evaluation – Outfall 004

Parameter	Estimated Allowable (ug/L)
Alkalinity	NA
Aluminum	NA
Ammonia	7.7
Antimony	32,000
Arsenic	680
Boron	NA
Barium*	NA
Beryllium	NA
Cadmium	5.6
Calcium	NA
Chloride (mg/L)	1,720
Chromium	900
Hexavalent Chromium	32
Cobalt	NA
Copper	20
Fluoride	NA
Iron*	NA
Lead	164
Lithium	NA
Manganese*	NA
Magnesium	NA
Molybdenum	NA
Mercury	2.8
Nickel	285
Nitrate*	NA
Nitrite	NA
Oil and Grease	See below
Potassium	NA
Radium 226 & 228*	NA
Selenium	40
Sodium	NA
Sulfate*	NA
Thallium	12
Zinc	183
Hardness	NA
TDS	NA
BOD	NA
TSS	See Below
pH	See Below
Turbidity	NA
Specific Conductance	NA
Temperature	NA
Flow	See Below

*These parameters have Human Health WQC for public water supplies only; therefore, the WQC for these parameters to not apply at the discharge.

GREY PARAMETERS do not have an applicable WQC

Table 2. Existing discharge limitations Outfall 004

A. Effluent Limitations and Monitoring Requirements

3. Outfall 004 – Low Volume Waste Settling Pond

a. There shall be no discharge of floating solids or visible foam in other than trace amounts.

b. During the period beginning with the permit's effective date and lasting until the expiration date, the permittee is authorized to discharge from Outfall Number 004. Such discharges shall be limited and monitored by the permittee as specified below.

Parameter	Discharge Limitations				Monitoring Requirements	
	Monthly Average[1]	Daily Maximum[1]	Minimum	Maximum[1]	Frequency	Sample Type
Flow[2] (MGD)	NL	NA	NA	NL	2/M	Estimate
pH	NA	NA	6.0 S.U.	9.0 S.U.	2/M	Grab
Heat Rejection (Unit 6)[3]	NA	NA	NA	$1.9x10^6$ BTU/hr	2/M	Calculated
Total Residual Chlorine (TRC)[4]	0.026 mg/L	NA	NA	0.038 mg/L	1/W	Grab
Temperature	NL (°C)	NA	NA	NL (°C)	1/W	IS
Oil and Grease (O&G)	15 mg/L	NA	NA	20 mg/L	2/M	Grab
Total Suspended Solids (TSS)	30 mg/L	NA	NA	100 mg/L	2/M	Grab
Total Nitrogen[5]	NL (mg/L)	NA	NA	NA	1/6M	Calculated
Total Kjeldahl Nitrogen (TKN)	NL (mg/L)	NA	NA	NA	1/6M	Grab
Nitrate+Nitrite ($NO_2 + NO_3$), as N	NL (mg/L)	NA	NA	NA	1/6M	Grab
Ammonia, as N	NL (mg/L)	NA	NA	NA	1/6M	Grab
Total Phosphorus	NL (mg/L)	NA	NA	NA	1/6M	Grab
Chronic Toxicity – *C. dubia* (TU_c)[6]	NA	NA	NA	NL	1/YR	Grab
Chronic Toxicity – *P. promelas* (TU_c)[6]	NA	NA	NA	NL	1/YR	Grab

Table 3. Possum Point Dewatering Discharge Evaluation – Outfall 005

Parameter	Estimated Allowable (ug/L)
Alkalinity	NA
Aluminum	NA
Ammonia	0.53
Antimony	1,280
Arsenic	300
Boron	NA
Barium*	NA
Beryllium	NA
Cadmium	1.8
Calcium	NA
Chloride (mg/L)	460
Chromium	117
Hexavalent Chromium	22
Cobalt	NA
Copper	14
Fluoride	NA
Iron*	NA
Lead	18
Lithium	NA
Manganese*	NA
Magnesium	NA
Molybdenum	NA
Mercury	1.54
Nickel	31
Nitrate*	NA
Nitrite	NA
Oil and Grease	See below
Potassium	NA
Radium 226 & 228*	NA
Selenium	10
Sodium	NA
Sulfate*	NA
Thallium	0.48
Zinc	185
Hardness	NA
TDS	NA
BOD	NA
TSS	See Below
pH	See Below
Turbidity	NA
Specific Conductance	NA
Temperature	NA
Flow	See Below

*These parameters have Human Health WQC for public water supplies only; therefore, the WQC for these parameters to not apply at the discharge.

GREY PARAMETERS do not have an applicable WQC

Table 4. Existing Permit Limits for Outfall 005

A. Effluent Limitations and Monitoring Requirements

4. Outfall 005 – Ash Pond E

a. There shall be no discharge of floating solids or visible foam in other than trace amounts.

b. During the period beginning with the permit's effective date and lasting until the expiration date, the permittee is authorized to discharge from Outfall Number 005. Such discharges shall be limited and monitored by the permittee as specified below.

Parameter	Discharge Limitations				Monitoring Requirements	
	Monthly Average[1]	Daily Maximum[1]	Minimum	Maximum[1]	Frequency	Sample Type
Flow[2] (MGD)	NL	NA	NA	NL	2/M	Estimate
pH	NA	NA	6.0 S.U.	9.0 S.U.	2/M	Grab
Oil and Grease (O&G)	15 mg/L	NA	NA	20 mg/L	2/M	Grab
Total Suspended Solids (TSS)	30 mg/L	NA	NA	100 mg/L	2/M	Grab

Parameter	Table 5. Possum Point Ash Pond Dewatering Evaluation: Estimated Allowable Discharge Concentrations (ug/L) at Dewatering Flows from 0.05 to 20 MGD					
	0.05	0.50	1	5	10	20
Alkalinity	NA	NA	NA	NA	NA	NA
Aluminum	NA	NA	NA	NA	NA	NA
Ammonia –N (mg/L)	336.09	33.85	17.06	3.62	1.94	1.10
Antimony	NA	NA	NA	NA	NA	NA
Arsenic	256,698.60	25,804.86	12,977.43	2,715.49	1,432.74	791.37
Boron	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA
Cadmium	2,714.40	272.49	136.83	28.30	14.73	7.94
Calcium	NA	NA	NA	NA	NA	NA
Chloride	357,704.99	35,977.50	18,103.75	3,804.75	2,017.37	1,123.69
Chromium	196,947.34	19,763.00	9,919.42	2,044.49	1,060.06	567.76
Hexavalent Chromium	14,695.60	1,479.46	745.23	157.85	84.42	47.71
Cobalt	NA	NA	NA	NA	NA	NA
Copper	10,536.36	1,061.86	535.49	114.40	61.76	35.42
Fluoride	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA
Lead	45,009.35	4,512.31	2,262.48	462.64	237.70	125.27
Lithium	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA
Molybdenum	NA	NA	NA	NA	NA	NA

Parameter	Table 5. Possum Point Ash Pond Dewatering Evaluation: Estimated Allowable Discharge Concentrations (ug/L) at Dewatering Flows from 0.05 to 20 MGD					
	0.05	0.50	1	5	10	20
Mercury	1,158.26	116.52	58.64	12.34	6.56	3.66
Nickel	50,806.55	5,099.35	2,560.06	528.61	274.67	147.67
Nitrate	NA	NA	NA	NA	NA	NA
Nitrite	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA
Radium 226 & 228	NA	NA	NA	NA	NA	NA
Selenium	6,051.60	609.66	307.33	65.47	35.23	20.12
Sodium	NA	NA	NA	NA	NA	NA
Sulfate	NA	NA	NA	NA	NA	NA
Thallium	69.34	7.15	3.70	0.93	0.59	0.41
Zinc	308,845.67	30,992.21	15,555.89	3,206.76	1,663.03	891.04
Hardness	NA	NA	NA	NA	NA	NA
TDS	NA	NA	NA	NA	NA	NA
BOD	NA	NA	NA	NA	NA	NA
Turbidity	NA	NA	NA	NA	NA	NA
Specific Conductance	NA	NA	NA	NA	NA	NA
Temperature	NA	NA	NA	NA	NA	NA

GREY PARAMETERS do not have an applicable water quality criteria or existing effluent limits

Dewatering Hardness	100	
Cooling Water Hardness (MGD)	170	
Mix Hardness	170	
ln(Mix Hardness)	5.14	
pH	8.4	
Temperature	39.1	
X Temp	0.6	
MIN	0.58	
Dewatering Flow (MGD)	0.05	Q1
Cooling Water Flow (MGD)	86.38	Q2

Wasteload Allocation Calculations for Possum Point Power Station Ash Dewatering Wastewater if Directed to the Cooling Water Outfall 001/002.

WLA = {((Q1+Q2)*WQS) - (Q2*C2)}/Q1

	Water Quality Criteria (WQS)*			
	Aquatic Life		Human Health	
Parameter	Acute	Chronic	PWS[B]	Other
Ammonia -N (Annual) (mg/L)[A]	3.9	0.26	NA	NA
Arsenic	340	150	10	NA
Cadmium[D]	7.1	1.7	5	NA
Chloride (mg/L)	860	230	250	NA
Chromium[CD]	879.7	114.4	100	NA
Hexavalent Chromium	16	11	NA	NA
Copper[D]	22.2	14.1	1300	NA
Lead[D]	233.6	26.5	15	NA
Mercury	1.4	0.77	NA	NA
Nickel[D]	285.6	31.9	610	4600
Selenium	20	5	170	4200
Thallium	NA	NA	0.24	0.47
Zinc[D]	183.7	185.2	7400	26000

C2	Wasteload Allocations*			
Cooling Water Background[E]	Acute	Chronic	Other	Most Restrictive
0.07	6,590.60	336.09	NA	336.09
1.50	585,132.60	256,698.60	NA	256,698.60
0.15	12,073.18	2,714.40	NA	2,714.40
23.08	1,446,722.99	357,704.99	NA	357,704.99
0.50	1,519,830.94	196,947.34	NA	196,947.34
2.50	23,338.60	14,695.60	NA	14,695.60
8.00	24,470.19	10,536.36	NA	10,536.36
0.50	402,920.15	45,009.35	NA	45,009.35
0.10	2,247.28	1,158.26	NA	1,158.26
2.50	489,413.44	50,806.55	1,050,127.00	50,806.55
1.50	31,980.60	6,051.60	291,270.60	6,051.60
0.20	NA	NA	69.34	69.34
5.00	308,845.67	311,442.67	12,783,002.00	308,845.67

* = All concentrations are (ug/L) unless otherwise noted.

A = Criterion are pH and temperature dependent. Used maximum values from application Form 2C.

B = The receiving stream is not designated as a public water supply and these criteria are not applicable.

C = WQC is for trivalent chromium

D = WQC is hardness-dependent. Hardness used is proportional mixing of mean hardness measured in Outfall 001/002 from WET tests and an estimated hardness for dewatering.

E = Cooling water background concentrations taken from data for Outfall 001/002 submitted with permit application. Where results were reported as < Detection Level (DL), 1/2 the DL was used as background.

Relevant VPDES Permit Fact Sheet Sections

Ammonia:

The freshwater, aquatic life Water Quality Criteria for Ammonia are dependent on the instream and/or effluent temperature and pH. Agency guidance uses the 90th percentile temperature and pH values because they best represent the critical design conditions of the receiving stream.

With the last reissuance, pH and temperature data from the tidal portion of Neabsco Creek (1ANEA000.57) were used as Neabsco Creek has similar characteristics to the tidal portion of Quantico Creek. It was staff's opinion that the data contained a sampling bias since most ambient samples were collected between 10 a.m. and 2 p.m. This time period is the period of highest photosynthetic activity in a shallow, open embayment such as the mouth of Neabsco Creek. During peak photosynthetic activity, the pH rises as carbon dioxide is taken up by the green autotrophic organisms, i.e. algae, present in the embayment (*Textbook of Limnology*, 3rd edition, G. Cole). Because of this sampling bias, staff used the 50th percentile pH and temperature values rather than the recommended 90th percentile temperature and pH values for the calculation of the ammonia as nitrogen Water Quality Criteria. These values are shown below in Table 7.

TABLE 7 – Instream 50th Percentile Derivations (2007)	
50th percentile pH	50th percentile temperature
8.2 S.U.	18°C

A new ambient monitoring station (1aQUA000.43) was installed in the tidal portion of Quantico Creek in March 2007. The use of data from this monitoring station is more appropriate given Outfall 004 and Outfall 005, for which ammonia criteria are being developed, discharge to Quantico Creek and an unnamed tributary to Quantico Creek, respectively. As such, staff has reviewed pH and temperature data from this monitoring station for the time period of March 2007 – July 2012 (Attachment 9b). Because ample data exists for the receiving stream it is staff's best professional judgement that the 90th percentile temperature and pH values be used as they best represent the critical design conditions of the receiving stream. The values are shown below in Table 8 were used to derive the criteria in Attachment 9a.

TABLE 8 – Instream 90th Percentile Derivations (2012)	
90th percentile pH	90th percentile temperature
8.1 S.U.	28°C

When instream temperature and pH data are available for use, staff must also use effluent pH and temperature data to establish the ammonia water quality standard to account for mixing in receiving waters. Of the four outfalls with discharges to Virginia state waters, Outfall 005 was selected for use as representative of all outfalls with regard to water quality criteria derivation. Outfall 005 was selected because metals criteria need to be evaluated for this discharge. The 90th percentile pH was derived from Outfall 005 DMR submissions dated April 2009 to May 2012 and was determined to be 8.6 S.U (Attachment 9b). Because the facility is not required to monitor temperature at this outfall, a default value of 25°C was used. The ammonia water quality standards calculations are shown in Attachment 9a.

* pH & Temp.

Metals Criteria:

The Water Quality Criteria for some metals are dependent on the receiving stream and/or effluent hardness (expressed as mg/L calcium carbonate). The average hardness of the receiving stream, Quantico Creek, is 46 mg/L.

When instream hardness data is available for use, staff must also use effluent hardness data to establish the hardness-dependent metals criteria. Again, Outfall 005 was selected for use as metals criteria need to be evaluated for only this outfall. Because there is no Total Hardness effluent data for Outfall 005, staff guidance suggests using a default hardness value of 50 mg/L $CaCO_3$ for streams east of the Blue Ridge.

The hardness-dependent metals criteria shown in Attachment 9a are based on the two values above.

d) Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes, and special standards for surface waters of the Commonwealth of Virginia.

1) *Quantico Creek and UT to Quantico Creek*
Quantico Creek and the unnamed tributary to Quantico Creek are located within Section 6 of the Potomac River Basin. This section has been designated with a special standard of "b".

Special Standard "b" (Potomac Embayment Standards) established effluent standards for all sewage plants discharging into Potomac River embayments and for expansions of existing plants discharging into non-tidal tributaries of these embayments. 9VAC25-415, Policy for the Potomac Embayments controls point source discharges of conventional pollutants into the Virginia embayment waters of the Potomac River, and their tributaries, from the fall line at Chain Bridge in Arlington County to the Route 301 bridge in King George County. The Potomac Embayment Standards are not applied to the facility's discharges since the discharges do not contain the pollutants of concern in appreciable amounts.

2) *Potomac River*
The mainstem of the Potomac River is considered Maryland waters. The receiving stream, per the Maryland Water Quality Criteria, has been designated as Use II water. The use goals include the support of estuarine and marine aquatic life and shellfish harvesting.

e) Threatened or Endangered Species

The Virginia Department of Game and Inland Fisheries (DGIF) Fish and Wildlife Information System Database was searched on June 5, 2012, for records to determine if there are threatened or endangered species in the vicinity of the discharge. The following threatened or endangered species were identified within a 2 mile radius of the discharge: Atlantic Sturgeon, Brook Floater, Peregrine Falcon, Upland Sandpiper, Loggerhead Shrike, Henslow's Sparrow, Bald Eagle, and Migrant Loggerhead Shrike. The limits proposed in this draft permit are protective of the Virginia Water Quality Standards and protect the threatened and endangered species found near the discharge.

The receiving streams are within a reach identified as having an Anadromous Fish Use. It is staff's best professional judgment that the proposed limits are protective of this use.

b) Tidal Water Quality Wasteload Allocations (Tidal WQWLAs):

The receiving streams, Quantico Creek, UT to Quantico Creek, and the Potomac River are tidally influenced. The acute wasteload allocations are established by multiplying the acute water quality criteria by a factor of 2 unless there is site specific dilution data available. The two times factor is derived from acute criteria being defined as one half of the final acute value (FAV) for a specific toxic pollutant. The FAV is determined from exposure of the specific toxicant to a variety of aquatic species, and is based on the level of a chemical or mixture of chemicals that does not allow the mortality, or other specified response, of aquatic organisms. These criteria represent maximum pollutant concentration values, which when exceeded, would cause acute effects on aquatic life in a short time period. For chronic wasteload allocations a dilution of 50 is used unless there is site specific dilution data available. The above Tidal WQWLA determinations are consistent with the instructions found within DEQ Guidance Memo 00-2011.

With the last permit reissuance, the facility was required to conduct a new mixing zone study. It was staff's best professional judgement that due to the retirement of Units 1 and 2 and the addition of Unit 6, operational changes at the Station warranted re-evaluation of the existing mixing zone boundaries from those approved in the mid-1980s study. In response to the permit requirement, the permittee conducted a detailed analysis of the mixing zone conditions and re-evaluated the accuracy of the mixing zone dimensions that were previously developed. The re-evaluation study plan was submitted to DEQ in October 2008, with the final thermal mixing zone modeling report submitted in October 2011. Statistical analysis of the positions of the thermal plume during extreme summer and winter simulations indicates that ninety-nine (99) percent of the time the plume would remain within about 657 and 507 acres, respectively, in Quantico Creek and a part of the Potomac River. The results of the re-evaluation do not differ significantly from those established in the mid-1980s study. Additionally, based upon temperature data collected, there have been no exceedances of the 3°C delta standard in Quantico Creek or the state water quality standard for temperature. Correspondence dated July 9, 2012, from the Virginia Department of Game and Inland Fisheries (DGIF) indicates that fish from Quantico Creek are all within expected ranges and are comparable to those from neighboring creeks. DGIF also indicates that there is no reason to believe there is any impairment to fishery resources in Quantico Creek as a result of the discharge from the Possum Point Power Station. The final thermal mixing zone modeling report is maintained within the Northern Regional Office's files and is found as Attachment 10. The correspondence from DGIF is found as Attachment 11.

Because site specific dilution data were not determined as part of the thermal mixing zone study, a default acute dilution factor of 2:1 and a default chronic dilution factor of 50:1 shall be used (based on DEQ Guidance Memo 00-2011). Please refer to the outfall discussions below for the applicability of dilution factors on an outfall-by-outfall basis. Attachment 9a summarizes the wasteload allocation determinations.

1) Outfalls 001/002, 003, and 005

Acute Wasteload Allocation (WLA_A)
Both Outfalls 001/002 and 003 discharge to Quantico Creek and Outfall 005 discharges to an unnamed tributary of Quantico Creek. Because site specific dilution data were not determined, it is staff's best professional judgement that as recommended in agency guidance a dilution factor of 2:1 is appropriate.

Chronic Wasteload Allocation (WLA_C)
Due to the shallow depth and confined morphometry of the Quantico Creek embayment and the volume of water being discharged by the Dominion – Possum Point Power Station, it is staff's best professional judgement that a dilution factor of 2:1 is more appropriate than the 50:1 dilution factor recommend in agency guidance. The factor of two has been used on similar embayments and has been demonstrated to be a reasonable estimate. As such, the chronic wasteload allocation (WLA_C) shall be determined by multiplying the chronic water quality criteria by two.

2X CHRONIC WQC

2) Outfalls 004, 007, 008 and 009

Acute Wasteload Allocation (WLA_A)
Due to the fact Outfall 004 discharges into tidal estuary waters in close proximity to the main stem of the Potomac River, and Outfalls 007, 008, and 009 discharge directly to the main stem of the Potomac River, the dilution factor of 2:1 recommended in agency guidance shall be used to calculate the acute wasteload allocation (WLA_A) for these outfalls. The acute waste load allocation shall be determined by multiplying the acute water quality criteria by two.

Chronic Wasteload Allocation (WLA_C)
The dilution factor of 50:1 recommended in agency guidance shall be used for the determining the chronic wasteload allocation (WLA_C) for these outfalls. The WLA_C shall be determined by multiplying the chronic water quality criteria by fifty.

50:1 CHRONIC WQC

c) Effluent Limitations and Monitoring

The following Federal Effluent Guideline abbreviations are used within the discussions in Section 17.c and Sections 19.a through 19.k of the Fact Sheet:

Best Available Technology – BAT
Best Practicable Technology – BPT
New Source Performance Standards – NSPS

1) Outfall 001/002

Heat Rejection:
Heat Rejection is defined as the rate of heat transfer from a unit's condenser to its circulating water system. It is calculated directly by conservation of mass and energy either across the circulating water system (condenser tube side) or from the turbine exhaust to the hotwell (condenser shell side). Heat Rejection is measured in BTU/Hour.

Because there have been no operational changes at the Possum Point Power Station which could impact the thermal component of the discharge from this outfall, no change to the heat rejection limit is proposed with this reissuance. As such, the previously established heat rejection limit of 5.58×10^8 BTU/hr shall be carried forward with this reissuance. The continuous monitoring frequency shall be carried forward.

Intake Temperature:
A Schedule of Compliance was included with the previous reissuance to implement temperature monitoring at the intake structure. The Schedule of Compliance was completed on October 23, 2008, and as such will be removed with this reissuance.

It is staff's best professional judgement that intake temperature monitoring continue with this reissuance. The monitoring frequency of once per day (1/D) shall be carried forward.

Discharge Temperature:
A Schedule of Compliance was included with the previous reissuance to implement temperature monitoring of the effluent. The Schedule of Compliance was completed on October 23, 2008, and as such will be removed with this reissuance.

It is staff's best professional judgement that effluent temperature monitoring should continue with this reissuance. The monitoring frequency of once per day (1/D) shall be carried forward.

Additional Testing Results on 10/06/2011 sample

OUTFALL NO 001/002

1. Pollutant and CAS NO. (*if available*)	2. MARK 'X'			3. EFFLUENT						d. No. OF ANALYSES	UNITS (*specify if blank*)		5. INTAKE (*optional*)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. MAXIMUM DAY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVG. VALUE (*if available*)			a. CONCENTRATION	b. MASS	a. LONG TERM AVG. VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
Uranium		x		0.00035	0.36	--	--	--	--	1	PPM	LBS/DAY	--	--	--
2,4-D		x		< 0.01	< 10.23	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Tl (dissolved)		x		0.0002	0.20	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Ti (dissolved)		x		< 0.002	< 2.05	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Sn (dissolved)		x		< 0.005	< 5.12	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Se (dissolved)		x		< 0.003	< 3.07	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Sb (dissolved)		x		< 0.001	< 1.02	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Pb (dissolved)		x		< 0.001	< 1.02	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Ni (dissolved)		x		< 0.005	< 5.12	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Mo (dissolved)		x		< 0.001	1.02	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Hg (dissolved)		x		< 0.0002	< 0.20	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Cu (dissolved)		x		0.008	8.19	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Cr (dissolved)		x		< 0.001	< 1.02	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Co (dissolved)		x		< 0.0006	< 0.61	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Cd (dissolved)		x		< 0.0003	< 0.31	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Be (dissolved)		x		< 0.0002	< 0.20	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Ba (dissolved)		x		0.038	38.89	--	--	--	--	1	PPM	LBS/DAY	--	--	--
As (dissolved)		x		< 0.003	< 3.07	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Ag (dissolved)		x		< 0.0001	< 0.10	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Zn (dissolved)		x		< 0.01	< 10.23	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Mn (dissolved)		x		0.04	40.93	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Mg (dissolved)		x		7.82	8002.35	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Fe (dissolved)		x		< 0.05	< 51.17	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Al (dissolved)		x		< 0.09	< 92.10	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Total Dissolved Solids		x		305.5	312623.65	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Total Hardness as CaCO3		x		111.15	113741.80	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Chlorides as Cl		x		23.08	23618.18	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Nitrate as N		x		1.44	1473.58	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Hydrogen Sulfide		x		< 0.05	< 51.17	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Chromium +6 as Cr6		x		< 0.005	< 5.12	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Nonylphenol		x		< 0.01	< 10.23	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Tributyltin			x	--	--	--	--	--	--	--	PPM	LBS/DAY	--	--	--
Kepone		x		< 0.0001	< 0.10	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Methoxychlor		x		< 0.0001	< 0.10	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Mirex		x		< 0.0001	< 0.10	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Endrin Aldehyde		x		< 0.0001	< 0.10	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Chlorpyrifos		x		< 0.0002	< 0.20	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Demeton		x		< 0.001	< 1.02	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Diazinon		x		< 0.001	< 1.02	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Guthion		x		< 0.001	< 1.02	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Malathion		x		< 0.001	< 1.02	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Parathion		x		< 0.001	< 1.02	--	--	--	--	1	PPM	LBS/DAY	--	--	--
Silvex		x		< 0.002	< 2.05	--	--	--	--	1	PPM	LBS/DAY	--	--	--

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (use the same format) instead of completing these pages.
SEE INSTRUCTIONS.

EPA I.D. NUMBER (copy from Item 1 of Form 1)
110000340774

V. INTAKE AND EFFLUENT CHARACTERISTICS (continued from page 3 of Form 2-C)

OUTFALL NO. 001/002

PART A –You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. Pollutant	2. EFFLUENT						3. UNITS (specify if blank)		4. INTAKE (optional)		
	a. MAXIMUM DAY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVG. VALUE (if available)		d. No. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVG. VALUE		b. NO. OF ANALYSES
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
a. Biological Oxygen Demand *(BOD)*	< 3.0	< 3069.954	--	--	--	--	1	PPM	LBS/DAY	--	--	--
b. Chemical Oxygen Demand *(COD)*	14.66	15001.84188	--	--	--	--	1	PPM	LBS/DAY	--	--	--
c. Total Organic Carbon *(TOC)*	25.8	26401.6044		--		--	1	PPM	LBS/DAY	--	--	--
d. Total Suspended Solids *(TSS)*	12.4	12689.1432		--		--	1	PPM	LBS/DAY	--	--	--
e. Ammonia *(as N)*	0.07	71.63226	--	--	--	--	1	PPM	LBS/DAY	--	--	--
f. Flow	VALUE 122.7		VALUE 122.7		VALUE 86.38		36	MGD	--	VALUE --		-- --
g. Temperature *(winter)*	VALUE 15.5		VALUE --		VALUE --		1	°C		VALUE --		-- --
h. Temperature *(summer)*	VALUE 39.1		VALUE --		VALUE --		1	°C		VALUE --		-- --
i. pH	7.7	8.4	--	--			36	STANDARD UNITS				

PART B – Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. Pollutant and CAS NO. *(If available)*	2.MARK 'X'		3. EFFLUENT						UNITS (specify if blank)		5. INTAKE (optional)		
	b. Believed Present	c. Believed Absent	a. MAXIMUM DAY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVG. VALUE (if available)		d. No. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVG. VALUE		b. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
a. Bromide (24959-67-9)	x		0.28	286.52904	--	--	--	--	1	PPM	LBS/DAY	--	--	--
b. Chlorine, Total Residual	x		< 0.1	< 102.3318	< 0.1	< 102.3318	< 0.1	< 72.04092	72	PPM	LBS/DAY	--	--	--
c. Color	x		20	--	--	--	--	--	1	PCU	--	--	--	--
d. Fecal Coliform		x	No Sample	--	--	--	--	--	--	--	--	--	--	--
e. Fluoride (16984-48-8)	x		0.11	112.56498	--	--	--	--	1	PPM	LBS/DAY	--	--	--
f. Nitrate - Nitrite *(as N)*	x		2.47	2527.59546	--	--	--	--	1	PPM	LBS/DAY	--	--	--

ITEM V-B CONTINUED

OUTFALL NO. 001/002

1. Pollutant and CAS NO. (if available)	2. MARK 'X'		3. EFFLUENT							UNITS (specify if blank)		5. INTAKE (optional)		
	a. Believed Present	b. Believed Absent	a. MAXIMUM DAY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVG VALUE (if available)		d. No. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVG VALUE		b. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION														
g. Nitrogen, Total Organic (as N)	x		0.4	409.33	--	--	--	--	1	PPM	LBS/DAY	--	--	--
h. Oil & Grease	x		< 5	< 5116.59	--	--	--	--	1	PPM	LBS/DAY	--	--	--
i. Phosphorus (as P), Total (7723-14-0)	x		< 0.32	< 327.46176	--	--	--	--	1	PPM	LBS/DAY	--	--	--
j. Radioactivity														
(1) Alpha		x	0.646	--	--	--	--	--	1	pCi/L	--	--	--	--
(2) Beta		x	2.79	--	--	--	--	--	1	pCi/L	--	--	--	--
(3) Radium, Total		x	--	--	--	--	--	--	1	pCi/L	--	--	--	--
(4) Radium 226, Total		x	--	--	--	--	--	--	1	pCi/L	--	--	--	--
k. Sulfate (as SO_4) (14808-79-8)	x		28.06	28714.30	--	--	--	--	1	PPM	LBS/DAY	--	--	--
l. Sulfide (as S)	x		< 0.05	< 51.17	--	--	--	--	1	PPM	LBS/DAY	--	--	--
m. Sulfite (as SO_3) (14265-45-3)		x	No Sample	--	--	--	--	--	--	--	--	--	--	--
n. Surfactants	x		< 0.01	< 10.23	--	--	--	--	1	PPM	LBS/DAY	--	--	--
o. Aluminum, Total (7429-90-5)	x		< 0.09	< 92.10	--	--	--	--	1	PPM	LBS/DAY	--	--	--
p. Barium Total (7440-39-3)	x		0.043	44.00	--	--	--	--	1	PPM	LBS/DAY	--	--	--
q. Boron, Total (7440-42-8)	x		0.02	20.47	--	--	--	--	1	PPM	LBS/DAY	--	--	--
r. Cobalt, Total (7440-48-4)	x		0.0007	0.72	--	--	--	--	1	PPM	LBS/DAY	--	--	--
s. Iron, Total (7439-89-6)	x		0.42	429.79	--	--	--	--	1	PPM	LBS/DAY	--	--	--
t. Magnesium, Total (7439-95-4)	x		8.04	8227.48	--	--	--	--	1	PPM	LBS/DAY	--	--	--
u. Molybdenum, Total (7439-98-7)	x		< 0.001	< 1.02	--	--	--	--	1	PPM	LBS/DAY	--	--	--
v. Manganese, Total (7439-96-5)	x		0.12	122.80	--	--	--	--	1	PPM	LBS/DAY	--	--	--
w. Tin, Total (7440-31-5)	x		< 0.005	< 5.12	--	--	--	--	1	PPM	LBS/DAY	--	--	--
x. Titanium, Total (7440-32-6)	x		< 0.002	< 2.05	--	--	--	--	1	PPM	LBS/DAY	--	--	--

Effluent Hardness Data

Table 3. Hardness (mg/L) Concentrations Measured in Samples Used in Whole Effluent Toxicity Tests with Outfalls 001/002, 003, 004, and 005.

	Location				
Date	**001/002**	**003**	**004**	**005**	**Intake**
6/25 - 6/30/08	142	118	80	82	128
	112	104	128	128	124
	114	122	144	124	118
6/26 - 7/1/09	112	112	114	110	152
	106	110	122	124	112
	108	122	100	116	128
7/14 - 7/19/10	314	290	268	168	290
	252	264	276	180	290
	250	294	428	180	244
7/20 - 7/25/11	140	138	94	144	126
	150	146	112	162	142
	124	132	124	158	132
7/24 - 7/26/12	180	164	292	176	236
	210	182	272	170	208
	236	238	198	170	238
Mean Values	**170**	**169**	**183**	**146**	**178**